AN OVERFLOWING ABOVE-GROUND SWIMMING POOL

The present invention relates to an overflowing above-ground swimming pool.

Known above-ground swimming pools essentially comprise a basin, consisting of a waterproof sheet, and a supporting structure.

Said supporting structure is usually realized by means of a wall of tubular or beam elements, connected by joints or hinges, and/or by means of metal plates or similar.

Such swimming pools are particularly appreciated for their low cost and easy installation, compared to underground swimming pools of the same dimensions.

Known above-ground swimming pools have a raised edge, that is to say, they are filled up to a level a few centimetres below the upper edge of the sheet, so as to avoid overflow of the water during the use of the swimming pool.

A water purification circuit is provided, that usually comprises at least a skimmer, through which the water of the swimming pool flows, a filter, one or more inlet openings into the basin and a pump.

The technique of realizing overflowing swimming pools is also known, in the field of underground swimming pools.

Such swimming pools comprise an overflowing channel along their perimetral edge, connected to a water purification and recirculation circuit, and are filled up to said edge, so as to obtain a continuos skimming of the water, which falls from the basin into the overflowing channel and, through said channel, is led to the

purification and recirculation circuit.

Said circuit usually comprises an external accumulation and compensation reservoir, a pump, a physical-mechanical filter – for example a cartridge filter or a sand filter – pipes and inlet openings leading purified water into the basin.

Overflowing swimming pools are more hygienic than swimming pools with raised edge, because dirt and floating impurities are continuously removed by the overflowing water; they are particularly suited for swimming competitions because the waves do not reflect at the edges; furthermore, they are better looking because they create an optical effect that seems to broaden the dimensions of the swimming pool itself.

However, underground swimming pools are very expensive, require long realization times, and are not always realizable, depending on the features of the ground.

It must also be considered that overflowing swimming pools must be perfectly leveled so as to avoid that overflowing occurs only along a limited portion of the perimetrical edge, and this further increase the realization costs.

The known technique used in the field of the above-ground swimming pools does not allow the realization of overflowing swimming pools, essentially because the supporting structures of the known above-ground swimming pools are not suitable and do not allow to realize the overflowing channel around the basin of the swimming pool.

On the other hand, the structures and the techniques for the

realization of underground overflowing swimming pools can not be used to realize above-ground overflowing swimming pools, because of their high cost and because these structures are designed to be undergrounded and surrounded with filling means such as sand or gravel, and therefore would not withstand the pressure of the water in above-ground installations.

The aim of the present invention to solve said inconveniences.

The first aim of the invention is to realize an overflowing above-ground swimming having both the advantages of an overflowing swimming pool and of an above-ground swimming pool.

A further aim of the invention is to realize an overflowing above-ground swimming pool that does not require the presence of an external compensation reservoir, further reducing the installation costs.

Another aim of the invention is to realize an overflowing above-ground swimming pool with a particularly efficient water purification system, that does not require high energy consumption for pumping the recirculated water.

Still another aim of the invention is to realize an overflowing above-ground swimming pool that may be installed almost everywhere and on any ground, in an easy and quick manner, and in particular that may be easily levelled to the ground.

Therefore, an aim of the present invention is to realize an economical overflowing above-ground swimming pool, having a light structure for easy transportation, easy to install, easy to disassemble for removing or displacing or for periods in which the swimming pool

is not used.

These aims and others that will be more evident hereinafter, are achieved by the invention, consisting of an above-ground swimming pool, comprising at least one basin, consisting of an impermeable sheet, and a supporting structure, characterized in that it comprises an overflowing channel contained in a space of said supporting structure defined between first internal supporting means, adjacent to said basin, and second supporting means, external to the first ones.

The main advantage consists in that by means of the present invention it is possible to realize an overflowing above-ground swimming pool, still having the easy installation, the light structure, the possibility of disassembling and the low cost of the known above-ground swimming pools.

In order to reduce installation costs and spaces, the overflowing channel is also realized with a waterproof sheet, and it may contain enough water to act as an accumulation and compensation reservoir.

The presence of a large overflowing channel furthermore allows to realize a gravity filter by means of a filtering sheet, placed in said overflowing channel, obtaining efficient water purification without using a filtering circuit that would require high pumping power.

For making the supporting structure of the swimming pool light, low-cost and easy to assemble, said struscture comprises two parallel lines of vertical rods, realized with tubular or beam elements connected by cross members, with fixed joints or hinges.

For making easier the installation and in particular the levelling to the ground, said structure further comprises adjustable ground

supports.

Further features and advantages of the invention will become apparent from the following detailed description, referring to some preferred embodiments showed in the enclosed figures, by way of non-limitative example.

Figure 1 shows a portion of an overflowing above-ground swimming pool according to the present invention, in a perspective schematical view.

Figure 2 shows a sectional view of the supporting structure of the swimming pool of figure 1, according to plane II-II of said figure.

Figure 3 shows a portion of the inner wall of the supporting structure of the swimming pool according to figure 1, in a front view.

Figure 4 shows a section of the structure of the swimming pool according to figure 1, according to a plane parallel to the horizontal plane.

Figure 5 shows, in a scheme, the structure of the swimming pool according to figure 1, in a section according to a vertical plane.

Figures 6 and 7 show more in detail some realization detail relative to some preferred embodiments of the present invention.

With reference to the above figures, the present invention relates to an overflowing above-ground swimming pool, mainly comprising a basin 1 consisting of a waterproof sheet 9, and a supporting structure 2.

Said basin 1 is realized, for example by means of a fabric sheet, made of polyester fibre coated with PVC or polyurethane.

The swimming pool, according to the invention, comprises an

overflowing channel 3 contained in a space V of the supporting structure 2, defined by first internal support means, adjacent to said basin 1, and by second support means external to said first ones.

In a preferred embodiment, said support means are obtained by means of two rows of vertical rods 2' and 2", following the perimeter of the basin itself.

Said overflowing channel 3 is advantageously realized with an impermeable sheet 10, similar to the one used for said basin 1, and it can contain enough water to act also as a water accumulation and compensation basin for said swimming pool.

The use of two different sheets for the basin 1 and the overflowing channel 3 is preferred, the transport and installation of the swimming pool being easier; however, in another embodiment (not shown), it is possible to realize the basin 1 and the overflowing channel 3 with the same sheet hooked to said supporting structure 2, i.e. sheets 9 and 10 may be regarded as two portions of a single sheet.

The overflowing channel 3 is connected to a recirculation circuit 13 for reintroducing into said basin 1 the water continuously overflowing into said channel, said recirculation circuit comprising at least one pump P, flexible pipes 14 and inlet openings 15.

An automatic system for the control of the water level in the overflowing channel 3, comprising a level sensor that controls a topping-up valve, of known kind, may also be provided.

The recirculation circuit 13 may comprise some known purification means, like sand filters or cartridge filters; however, in a preferred embodiment, the overflowing swimming pool comprises a

gravity filter according to the Italian patent application No. CR2002A000013 of the same applicant.

Said gravity filter is realized by means of a filtering sheet 12, placed in the overflowing channel 3, between the water level of the basin 1 and the water level of said channel, so as to be crossed by the water that flows from said basin 1 into said channel.

This filter is very efficient, because the water flows through it at a very low speed; furthermore, it is separated from the recirculation circuit 13 and does not cause any head loss, allowing the use of an economical, low-head water pump that reduces costs and energy consumption.

The filtering sheet 12 is hooked to the sides of the overflowing channel 3 so as to be easily removed for periodical cleaning and replacing.

These and other advantages deriving from the use of this filter are described more in detail in the cited patent application.

The portion of the space V below the overflowing channel 3 may contain accessory elements, like the flexible pipes 14 and the pump P of the recirculation circuit 13, or other accessories.

The supporting structure 2 comprises ground supports 6 which, advantageously, allow height adjustement when the structure is already assembled, to level the basin 1 horizontally.

Said structure advantageously comprises also a continuous, essentially plain and rigid surface S1, that gives lateral support to the sheet 9 and realizes an inner rigid wall around said basin 1.

The presence of a rigid wall around said basin 1 is useful, for

example, to turn during swimming competitions.

Similarly, said structure 2 may comprise an outer surface S2 giving a continuous support for the junction of the sheet 10, or for closing the space V towards the outside.

A grated gangway 16, or other pedestrian covering, is provided along the perimeter of the basin 1, closing the top of the overflowing channel 3. Further elements suitable for a comfortable use or for safety, like a handrail or a ladder, are not shown.

Relating in particular to the preferred embodiment shown in the enclosed figures, the structure 2 comprises vertical rods 2' and 2" connected by cross elements 4 and struts 5, placed at a suitable distance one from the other according to the loads.

Said vertical rods 2' and 2" are supported by a threaded bar 8 by means of regulation nuts 7. Said threaded bar is fixed to a plate 31 resting on the ground.

The structure 2 also comprises panels 11, fixed to the vertical rods 2' and 2" on the longitudinal plane, that form said surfaces S1 and S2.

As it can be seen better from figure 4, vertical rods 2' and 2" are omega (Ω) shaped, with a central, C-shaped part and lateral edges 30, onto which said panels 11 are resting.

These latter are fixed to the vertical rods, on the sides of the central C-shaped part, by means of screws or bolts, not shown.

The vertical rods 2' and 2" are specular, and the cross elements 4 are realized with C-shaped beams or similar, fixed to said vertical rods for example with screws.

Further reinforcing bars, placed on the longitudinal plane, may be fixed or screwed to the edges 30 of the vertical rods 2' or 2", in order to strengthen the structure.

Vertical rods 2' and 2" are preferably made of galvanized steel, for obtaining a light and low-cost structure, resistant to corrosion and atmospheric agents.

Panels 11 may also be realized with folded galvanized steel plate, according to fig. 4.

Figures 6 and 7 show two solutions for obtaining the hooking of sheets 9 and 10 and of the filtering sheet 12.

According to figure 6, stop ropes 17 are fixed to the edges of the sheets 9 and 10 by means of a cuff of the sheets welded or sewed on itself.

The edges of the sheets are then hooked to the supporting structure 2 with a metal beam 18, adapted to retain said ropes 17, fixed to the supporting structure 2 by means of screws 19.

Said metal beam 18 has also a flange 20, adapted to support the gangway 16.

An edge 21 of impermeable sheet, welded to said sheet 9, covers the beam 18 for making the passage between the basin 1 and the overflowing channel 3 impermeable to water.

The filtering sheet 12 comprises, at its edges, stop ropes 22, and reversible hooking means for said sheet are provided, realized with rotating hooks 23 connected to said beam 18.

Said rotating hooks 23 may be transversally rotated referring to said overflowing channel 3, to block the edges of said filtering sheet

12, or they may be longitudinally rotated referring to said channel, leaving the edges of said filtering sheet 12 free for installation or removal thereof.

According to figure 7, on the other hand, the sheet 9 is hooked by means of a longitudinal blocking element 24, fixed to the supporting structure 2 by means of screws or bolts 25, and also in this case it comprises a retaining rope 17 for preventing the sheet from slipping.

In this case, the sheet 10 is directly welded to the sheet 9, while the sheet 12 is reversibly hooked by means of a joint 26 comprising a beam 27, into which the edges of said sheet 12 and an edge 28 of said sheet are hooked, welded to said sheet 10.

Said beam 27 is advantageously made of aluminium, in sections about one meter long.

A further sheet 29 forms a deflector for the overflowing water and leads it on the filtering sheet 12.

It is evident that other hooking means for the sheets may be used, according to the technique known in the field of above-ground swimming pools.

When the basin 1 is filled up with water, the hydrostatic pressure generates a horizontal force which, according to the dimensions of the swimming pool, may be considerable and may induce an overturning of the structure.

In these cases, inner vertical rods 2' should be fixed to the ground to withstand traction forces, or linked each other by means of rigid beam elements at the base of the supporting structure 2.

A solution for preventing the overturning force on the supporting structure 2 consists in realizing sheet 9 of suitable dimension so that, once filled with water, said sheet behaves like a tensostructure, assuming a shape similar to the one shown in figure 1 and schematically shown also in figure 5.

Thanks to this behaviour of the sheet 9, the tension of the sheet balances, at least partially, the hydrostatic pressure in the horizontal direction, and a vertical load, equal to the tension of the sheet 9, is discharged to the supporting structure 2.

Thus the danger of overturning of the structure is avoided, as well as the need of linking the vertical rods to the ground so as to resist to traction forces.

The invention is susceptible of numerous modifications and variations, all of which are within the scope of the inventive concept; all the details may also be replaced with other technically equivalent elements.

In practice, the materials employed, so long as they are compatible with the specific use, as well as the dimensions, may be any according to requirements and to the state of the art.